

Rec'd PCT/PTO 18 OCT 2004

511,930

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 October 2003 (30.10.2003)

PCT

(10) International Publication Number
WO 03/089295 A2

(51) International Patent Classification⁷: B64C

(21) International Application Number: PCT/US03/12008

(22) International Filing Date: 17 April 2003 (17.04.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/373,653 18 April 2002 (18.04.2002) US

(71) Applicant (for all designated States except US): AIRBUS DEUTSCHLAND GMBH [DE/DE]; Kreetslag 10, 21129 Hamburg (DE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): BERTOLOTTI, Fabio, P. [US/US]; 15 Ivy Lane, South Windsor, CT 06074 (US).

(74) Agent: FASSE, Walter, F.; Fasse Patent Attorneys, P.A., 58-G Main Road North, P.O. Box 726, Hampden, ME 04444-0726 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

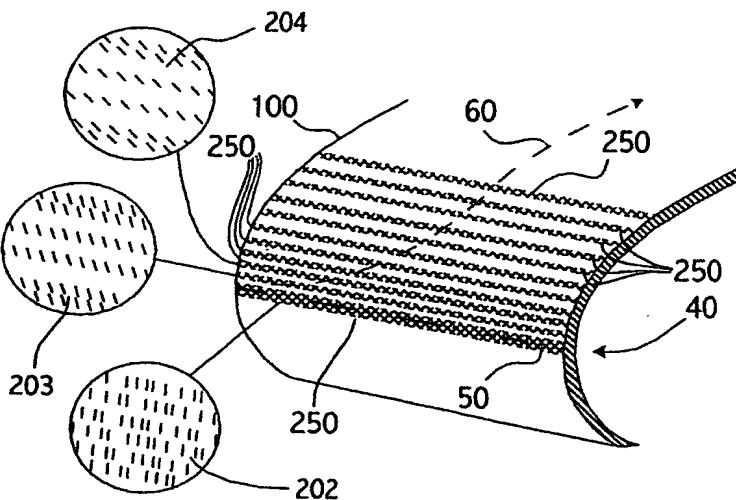
— of inventorship (Rule 4.17(iv)) for US only

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PERFORATED SKIN STRUCTURE FOR LAMINAR-FLOW SYSTEMS



WO 03/089295 A2

(57) Abstract: The outer skin (100) of an aerodynamic body (40) has perforations (200) arranged in particular patterns in respective spanwise extending groups or bundles (250). Each perforation is preferably a micro-slot with a length of 100 to 3000 μm and a width of 50 to 250 μm . Air is sucked through the micro-slots from the boundary layer flowing over the outer skin, to achieve boundary layer control. In each bundle, the pattern, size, orientation, and other parameters of the micro-slots are designed to achieve mutual destructive interference of flow disturbances arising due to the suction, to minimize the excitation of flow instabilities in the boundary layer. Particularly, the spatial spectrum of the perforation pattern of a given bundle is essentially absent of significant energy at predetermined wavelengths of predetermined flow instabilities that otherwise appear in the boundary layer air flow. The aerodynamic body further includes supporting ribs (300) extending parallel to the perforation bundles (250) and a perforated inner plate (400) providing a throttling control of the suction flow through groups of the bundles.

Best Available Copy